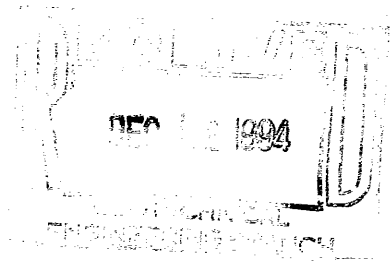


GEOTECHNICAL ENGINEERING
BRANCH



GEI Consultants, Inc.



REMOVAL OF SEDIMENT FROM RELIEF WELLS
HOPKINTON DAM
HOPKINTON, NEW HAMPSHIRE
Contract No. DACW33-91-D-0008
Delivery Order No. 008

Submitted to

U.S. Army Corps of Engineers
New England Division
Waltham, MA 02254

1021 Main Street
Winchester, MA 01890-1970
(617) 721-4000

GEOTECHNICAL ENGINEERING
BRANCH

Project 93262
December 9, 1994

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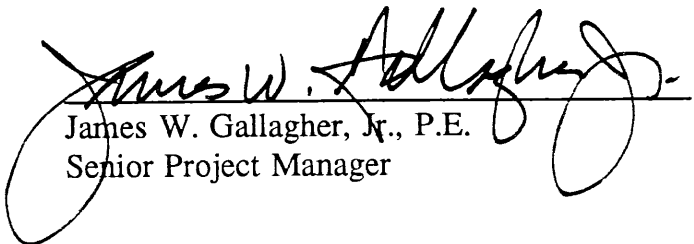
Submitted to

U.S. Army Corps of Engineers
New England Division
424 Trapelo Road
Waltham, MA 02254

by

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1021 Main Street
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Project 93262



James W. Gallagher, Jr., P.E.
Senior Project Manager

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1. INTRODUCTION

1.1 Purpose

This report describes the work performed by GEI Consultants, Inc. (GEI) to remove sediment from eight relief wells at the downstream toe of Hopkinton Lake Dam, Hopkinton, New Hampshire.

1.2 Scope

As part of this project, GEI performed the following scope of work:

- a. prepared a Site Safety and Health Plan (SSHP), in accordance with U.S. Army Corps of Engineers guidelines, for the removal and disposal of contaminated sediment and water from the relief wells;
- b. engaged a subcontractor, New Hampshire Boring, Inc., of Derry, New Hampshire, to pump accumulated sediment from each well;
- c. pumped water and sediment from the relief wells into a 20,00-gallon capacity temporary holding tank;
- d. winterized the holding tank and engaged a boiler contractor, C. D. Boiler Works of Hooksett, New Hampshire, to install a mobile boiler to thaw the stored water;
- e. sampled and analyzed a water sample from the temporary holding tank for volatile organic compounds (VOCs), polyaromatic hydrocarbons (PAHs), RCRA metals, pesticides, and herbicides;
- f. provided for the transfer of the stored sediment and water into transport tank trucks for disposal by Total Waste Management Corporation of Newington, New Hampshire; and
- g. prepared and submitted this report describing the procedures used and containing the data and results of all work performed.

1.3 Authorization

This work was authorized by Delivery Order No. 8 dated July 28, 1993, under Indefinite Delivery Contract No. DACW33-91-D-0008 between GEI and the U.S. Army Corps of Engineers.

1.4 Project Personnel

The following personnel at GEI conducted the field work and prepared this report.

James W. Gallagher, Jr. P.E.
Shyam S. Ranjitkar
A. Ridgely Mauck
Alton P. Davis, Jr., P.E.

Project Manager
Project Engineer
Project Engineer
In-House Consultant

2. SITE AND PROJECT DESCRIPTION

2.1 Site Description

Hopkinton Lake Dam is located on the Contocook River in West Hopkinton, New Hampshire, where State Route 127 crosses the river. As part of the original construction of the dam, eight relief wells with wood-stave screens were installed in the downstream toe of the dam. The well locations are shown in Fig. 1.

2.2 Previous Work

Depth soundings taken within the wells by the Corps of Engineers indicated that sediment had accumulated in the bottom of the wells to depths varying between 2 and 12 feet. Under Delivery Order No. 7 to Indefinite Delivery Contract No. DACW33-91-D-0008, the Corps of Engineers contracted with GEI to remove the sediment and clean the relief wells. As part of this work, GEI engaged Alfred Rogers Cullimore Concepts, Inc. (ARCC) of Daytona Beach, Florida, to clean and redevelop the wells using the "Blended Chemical Heat Treatment" process. During the initial bailing of the wells, sediment removed from the wells exhibited an oily sheen and had a strong smell similar to that of creosote. Chemical analyses performed by the Corps of Engineers on two samples of the sediment from the wells indicated that the sediment contained creosote preservative that had apparently leached from the wood-stave well screens. Based on these results, the Corps of Engineers suspended work on Delivery Order No. 7, and later issued Delivery Order No. 8 requiring that the sediment be removed, contained, and properly disposed of off-site, along with any water generated in the sediment removal process.

3. DESCRIPTION OF WORK PERFORMED

3.1 Site Safety and Health Plan

A comprehensive Site Safety and Health Plan (SSHP) was prepared for the removal and disposal of contaminated water and sediments from the relief wells. The SSHP was prepared in accordance with Corps of Engineers guidelines, and was reviewed and approved by Corps Health and Safety personnel. A copy of the plan is attached as Appendix A.

3.2 Mobilization of Equipment and Personnel

GEI engaged a subcontractor, New Hampshire Boring of Derry, New Hampshire, to provide the equipment, including submersible pumps and discharge hoses, to pump the sediment from the relief wells. GEI also engaged Total Waste Management Corporation (TWM) of Newington, New Hampshire to supply two 20,000 gallon capacity Frac Tanks to temporarily store the sediment and water generated during the sediment removal operation. All equipment was mobilized to the site on January 3, 1994. The Frac Tanks were situated on a relatively flat area west of the stilling basin at the end of the access road.

3.3 Sediment Removal Operation

The sediment removal operation was conducted between January 3 and January 24, 1994. The weather was unusually cold and several significant snowstorms occurred during this period, resulting in delays in the operation.

The following is a description of the sediment removal operation for each well. The results of the sediment removal operation, in terms of the depths to the bottom of each relief well before and after the sediment removal operation, are summarized in Table 1.

3.3.1 Relief Well No. 1

As proposed in the Scope of Work for Delivery Order No. 8, the initial attempts to remove the sediment from the relief wells were made using submersible pumps. On January 3, 1994, a submersible pump was lowered to the bottom of Relief Well RW-1. The discharge line of the pump, consisting of High Density Polyethylene (HDPE) Pipe, discharged into the top pot of one of the Frac Tanks.

Before the pump was started, the depth from the top of the casing to the bottom of the well was measured to be 71.16 feet. The pump was then operated at a rate of 3 to 5 gallons per minute (gpm). The flow rate was measured using a 5-gallon bucket and a stopwatch. During the pumping, the air within the work zone was monitored for organic vapors using a Photoionization Detector (PID). No organic vapors were

detected using the PID. However, the pumped water exhibited an oily sheen, was black in color, and had a smell similar to that of creosote.

The pump was pushed up and down to agitate the sediments. After every agitation the outflow appeared darker. After approximately two hours of pumping the pump stopped operating. The pump was retrieved from the well, and an inspection revealed that the pump had become coated with a black, rubbery, tar-like substance, and the inside of the pump was clogged with the same material. The depth to the bottom of the well was measured to be 71.20 feet.

On January 5, 1994, a new submersible pump was lowered into the well. In addition a steam jet was applied to the bottom of the well to attempt to loosen the tar-like material. The pump was operated at a flow rate of approximately 20 gpm. The outflow was very dark and had an oily sheen. After a short period of operation, the pump became clogged and stopped operating. The depth to the bottom of the well was still at 71.20 feet. Based on these results, it was determined that all the removable sediment had been pumped from the well.

3.1.2 Relief Well RW-2

Before pumping was initiated in Relief Well RW-2, the depth to the bottom of the well was measured to be 62.8 feet. Submersible pumps were lowered into the well on January 10, 11, and 12, 1994. Each time the pumps became clogged and could not operate. After these repeated failures, GEI determined that the submersible pumps were unsuitable for removing the sediments from the wells and recommended that a diaphragm pump which is more suitable for pumping solids be used. A diaphragm pump is not submersible, so GEI recommended that an intake pipe be provided which could be lowered to the bottom of the well. A diagram of this alternative cleanout system is provided in Fig. 2. As shown in Fig. 2, a 45° notch was cut in the bottom of the pipe to facilitate pumping and sediment removal. The proposed alternative cleanout system was presented to and approved by the Corps of Engineers on January 12, 1994.

On January 14, 1994, the alternative cleanout system was assembled and the intake pipe was lowered into Relief Well RW-2. The diaphragm pump was powered by a Honda 3.5 horsepower motor. The alternative cleanout system effectively removed the sediment. Pumping continued until there was no change in the depth from the top of the casing to the bottom of the well, even with continued pumping. At the end of the pumping, the depth to the bottom of the well was still at 70.50 feet.

3.1.3 Relief Wells RW-3 and RW-4

The alternative cleanout system could quickly remove sediments from the relief wells. As a result, Relief Wells RW-3 and RW-4 were also cleaned out on January 14, 1994.

detected using the PID. However, the pumped water exhibited an oily sheen, was black in color, and had a smell similar to that of creosote.

The pump was pushed up and down to agitate the sediments. After every agitation the outflow appeared darker. After approximately two hours of pumping the pump stopped operating. The pump was retrieved from the well, and an inspection revealed that the pump had become coated with a black, rubbery, tar-like substance, and the inside of the pump was clogged with the same material. The depth to the bottom of the well was measured to be 71.20 feet.

On January 5, 1994, a new submersible pump was lowered into the well. In addition a steam jet was applied to the bottom of the well to attempt to loosen the tar-like material. The pump was operated at a flow rate of approximately 20 gpm. The outflow was very dark and had an oily sheen. After a short period of operation, the pump became clogged and stopped operating. The depth to the bottom of the well was still at 71.20 feet. Based on these results and the fact that this depth is consistent with the measured depth to the bottom of the other relief wells, it was determined that all the removable sediment had been pumped from the well.

3.1.2 Relief Well RW-2

Before pumping was initiated in Relief Well RW-2, the depth to the bottom of the well was measured to be 62.8 feet. Submersible pumps were lowered into the well on January 10, 11, and 12, 1994. Each time the pumps became clogged and could not operate. After these repeated failures, GEI determined that the submersible pumps were unsuitable for removing the sediments from the wells and recommended that a diaphragm pump, which is more suitable for pumping solids be used. A diaphragm pump is not submersible, so GEI recommended that an intake pipe be provided which could be lowered to the bottom of the well. A diagram of this alternative cleanout system is provided in Fig. 2. As shown in Fig. 2, a 45° notch was cut in the bottom of the pipe to facilitate pumping and sediment removal. The proposed alternative cleanout system was presented to and approved by the Corps of Engineers on January 12, 1994.

On January 14, 1994, the alternative cleanout system was assembled and the intake pipe was lowered into Relief Well RW-2. The diaphragm pump was powered by a Honda 3.5 horsepower motor. The alternative cleanout system effectively removed the sediment. Pumping continued until there was no change in the depth from the top of the casing to the bottom of the well. At the end of the pumping, the depth to the bottom of the well was down to 70.50 feet.

3.1.3 Relief Wells RW-3 and RW-4

The alternative cleanout system could quickly remove sediments from the relief wells. As a result, Relief Wells RW-3 and RW-4 were also cleaned out on January 14, 1994.

Before pumping began, the depth from the top of the casing to the bottom of the well was measured to be 69.2 feet in RW-3 and 68.0 feet in RW-4. After pumping, the depth was measured to be 71.6 feet in RW-3 and 70.6 feet in RW-4.

3.1.4 Relief Well RW-5

The sediment in Relief Well RW-5 was removed on January 19, 1994. Before pumping began, the depth from the top of the casing to the bottom of the well was measured to be 65.5 feet. After pumping, the depth was measured to be 71.2 feet.

3.1.5 Relief Wells RW-6, RW-7, and RW-8

Relief Wells RW-6, RW-7, and RW-8 were cleaned on January 24, 1994. Before pumping began, the depth from the top of the casing to the bottom of the well was measured to be 65.4 feet in RW-6, 66.8 feet in RW-7 and 66.8 feet in RW-8. After pumping, the depth was measured to be 70.85 feet in RW-6, 72.3 feet in RW-7, and 72.5 feet in RW-8.

3.4 Winterization of Frac Tank

Because of the extremely cold temperatures that occurred at the site during the months of January and February, the water that was pumped from the relief wells froze in the Frac Tank used for storage. The water had to be thawed so that it could be disposed. To thaw the water, GEI contracted with C. D. Boiler Works of Hooksett, New Hampshire to provide an oil-fired mobile boiler for a two-and-a-half week period. To thaw the ice in the Frac Tank, water was pumped from the Frac Tank, circulated and heated through the boiler, and discharged back into the Frac Tank. GEI also purchased and installed insulating blankets on the Frac Tank to expedite the thawing process and keep the water from refreezing once it thawed.

3.5 Sampling and Chemical Analysis of Sample from Frac Tank

To characterize the sediment and water for proper disposal, GEI obtained a sample from the Frac Tank. The sediment formed a thin layer on the bottom of the Frac Tank, and a sample of it could not be obtained from the access port on the top of the Frac Tank. However, a water sample was collected and sent to Aquarian Analytical, Inc. in Canterbury, New Hampshire, to be analyzed for volatile organic compounds (VOCs), polyaromatic hydrocarbons (PAHs), RCRA metals, pesticides, and herbicides. The results of the chemical analyses are summarized in Table 2, and the full laboratory report of the chemical analyses is provided in Appendix B.

3.6 Disposal of Sediment and Water

Based on the results of these analyses, the water generated from the sediment removal operation and stored in the Frac Tank was characterized and disposed of by TWM as a non-hazardous waste. A total of 7,200 gallons of water were disposed by TWM on March 7, 1994. Copies of the manifests for the disposal of the water is provided in Appendix C.

When the water was pumped from the Frac Tank for disposal, a residue of sediment coated the floor and walls of the tank. The TWM tank cleaning crew collected this sediment in two 55-gallon drums. The sediment was silt and fine to medium sand. The sediment was characterized by TWM based on the chemical analyses performed by the Corp of Engineers of the sediment obtained from the relief wells in November 1992. As indicated in the Waste Profile, the sediment was characterized as being greater than 99% soil, contaminated with oil, and containing lead at a concentration of 130 parts per million (ppm) and arsenic at a concentration of 28 ppm. A copy of the TWM Waste Profile is provided in Appendix C. Based on this profile, TWM disposed of the two drums of sediment as a hazardous waste for incineration on June 1, 1994. A copy of the manifest for the disposal of the sediment is provided in Appendix C.

TABLE 1 - RESULTS OF SEDIMENT REMOVAL
Hopkinton Dam
Hopkinton, New Hampshire

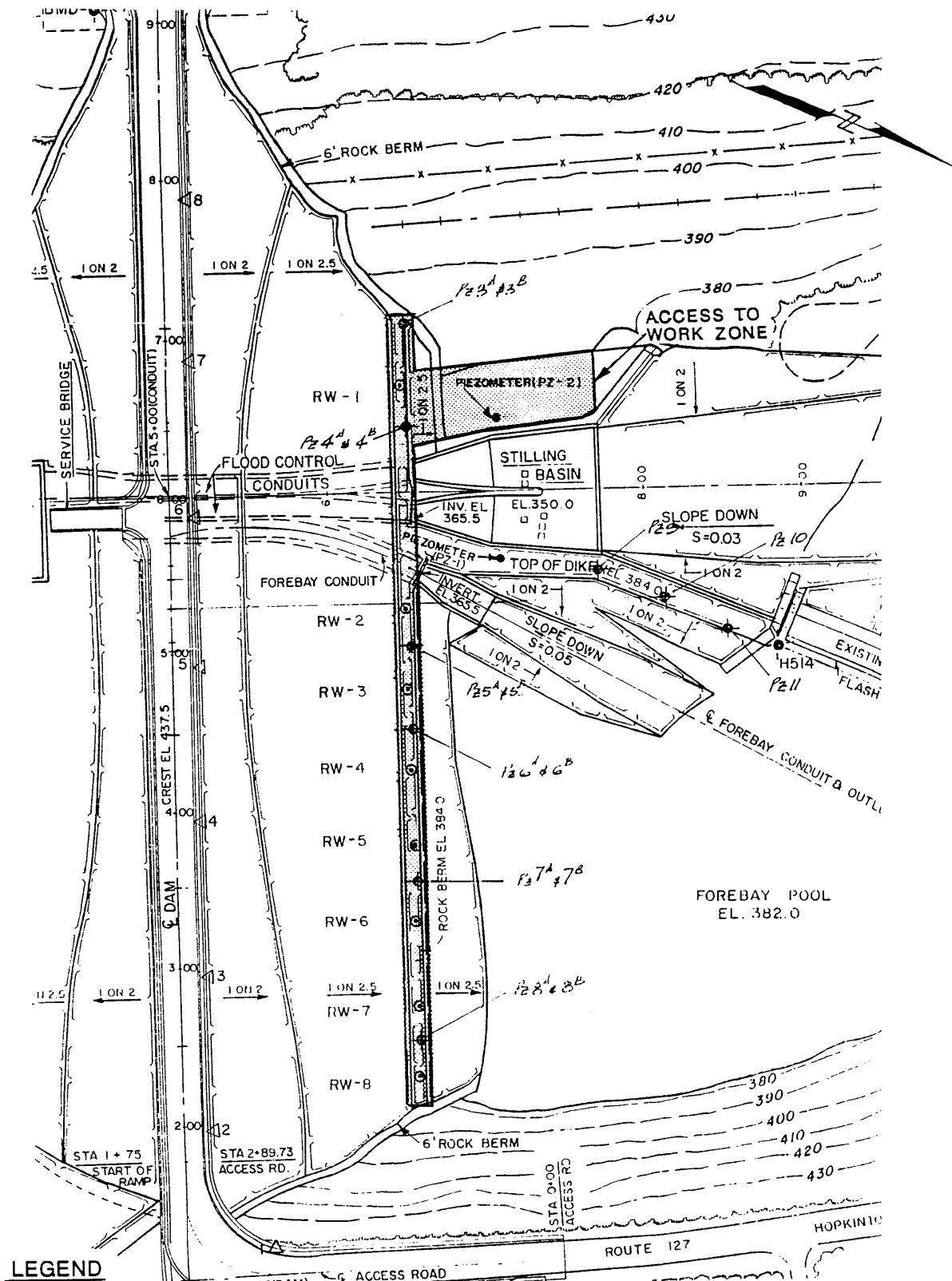
Relief Well	Date Started	Date Completed	Depth to Bottom Before Cleaning (feet)	Depth to Bottom After Cleaning (feet)
RW-1	1/3/94	1/5/94	71.16	71.20
RW-2	1/11/94	1/14/94	62.80	70.50
RW-3	1/14/94	1/14/94	69.20	71.60
RW-4	1/14/94	1/14/94	68.00	70.60
RW-5	1/19/94	1/19/94	65.50	71.20
RW-6	1/24/94	1/24/94	65.40	70.85
RW-7	1/24/94	1/24/94	66.80	72.30
RW-8	1/24/94	1/24/94	66.60	72.50

TABLE 2 - ANALYTICAL RESULTS OF SAMPLE FROM FRAC TANK
Hopkinton Dam
Hopkinton, New Hampshire

Parameter	Concentration ($\mu\text{g/l}$)
Volatile Organic Compounds¹	
Benzene	4
Toluene	50
Ethylbenzene	9
m&p-Xylene	20
O-Xylene	16
Methyl t-butyl ether	5
Poly Aromatic Hydrocarbons²	
Acenaphthene	29
Anthracene	3
Fluoranthene	8
Fluorene	15
Phenanthrene	2
Pyrene	5
1-Methylnapthalene	7
RCRA Metals	ND ³
Polychlorinated Biphenyls	ND
Pesticides and Herbicides	ND

Notes:

- Only those VOCs that were detected at concentrations above the method detection limits are presented in this table. Refer to the full laboratory report in Appendix B for a list of all the VOCs for which analyses were performed and for the corresponding method detection limits.
- Only those PAHs that were detected at concentrations above the method detection limits are presented in this table. Refer to the full laboratory report in Appendix B for a list of all the PAHs for which analyses were performed and for the corresponding method detection limits.
- ND = Not detected in concentrations above the method detection limit. See the full laboratory report in Appendix B for the method detection limits.



LEGEND

RW-1 RELIEF WELL
WORK ZONE

NOT TO SCALE

U.S. Army Corps of Engineers
New England Division
Waltham, Massachusetts

Cleanout of Relief wells
Hopkinton Lake Dam
Hopkinton, New Hampshire

SITE PLAN

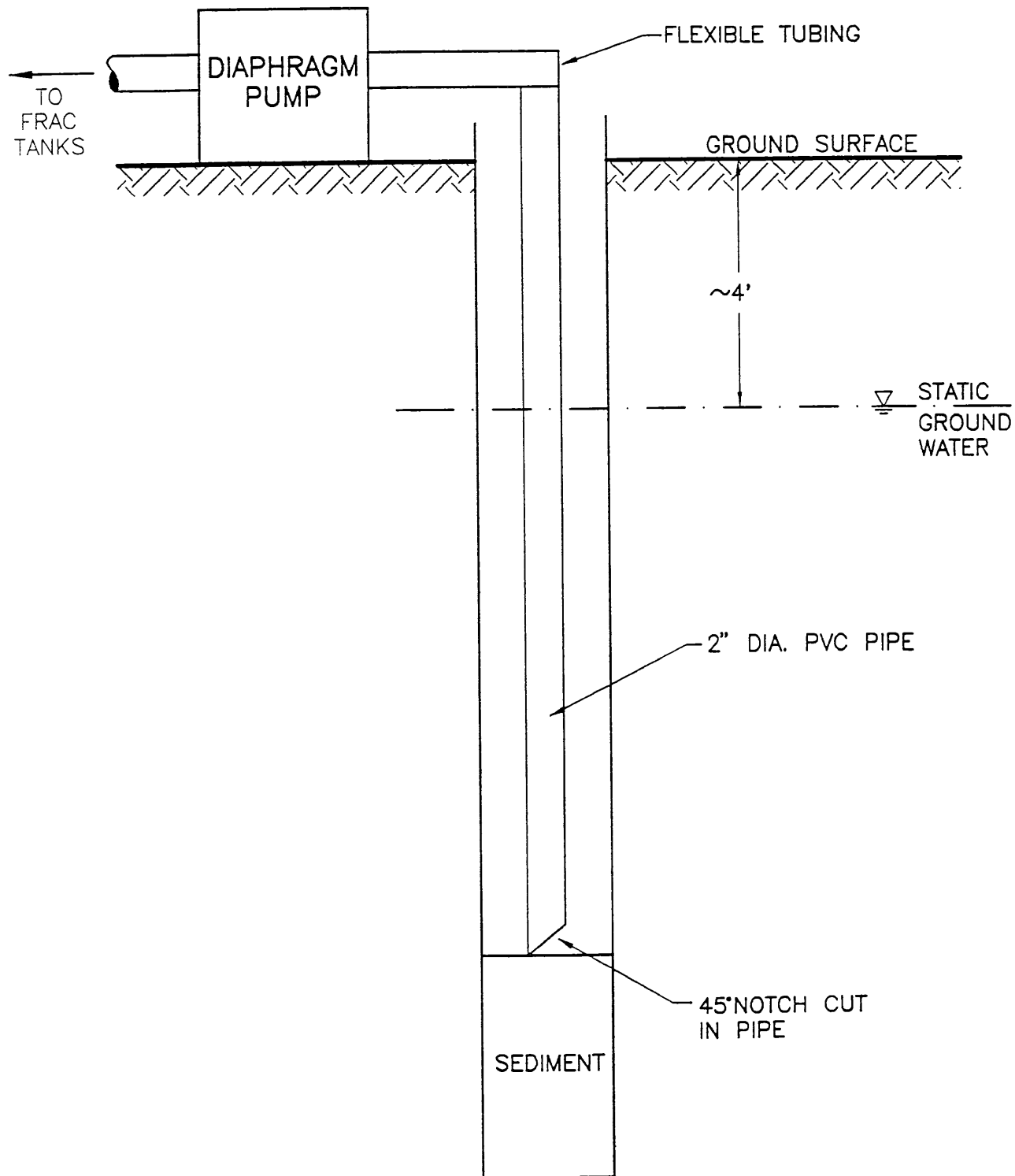


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December 1994

Fig. 1



93262003 10/03/94 EEV

U.S Army Corps of Engineers
New England Division
Waltham, Massachusetts

Cleanout of Relief Wells
Hopkinton Lake Dam
Hopkinton, New Hampshire

RELIEF WELL
CLEANOUT DIAGRAM



GEI Consultants, Inc.

Project 93262

December 1994

Fig. 2

APPENDIX A

Site Safety and Health Plan

**SITE SAFETY AND HEALTH PLAN (SSHP)
REMOVAL OF SEDIMENT FROM RELIEF WELLS
HOPKINTON LAKE DAM
WEST HOPKINTON, NEW HAMPSHIRE**

CORPS OF ENGINEERS CONTRACT NO. DACW33-91-D-0008, Task No. 8

Site Name: Hopkinton Lake Dam

Site Address: Route 127, Hopkinton
New Hampshire

1. Site and Project Description

Hopkinton Lake Dam is located on the Contocook River in West Hopkinton, New Hampshire, where State Route 127 crosses the river. As part of the original construction of the dam, eight relief wells with wood-stave screens were installed in the downstream toe of the dam. Recent well depth soundings indicate that sediment has accumulated in the bottom of each of the wells to depths varying between 2 and 12 feet. The results of chemical analyses performed on samples of the sediment from two of the relief wells indicate that they contain some of the creosote preservative that has apparently leached from the wood-stave well screens.

The work to be performed as part of this project consists of the removal of the accumulated sediment from each of the eight relief wells. The sediment will be pumped out of the wells using submersible pumps. The sediment and any water pumped from the wells will be collected in temporary holding tanks. The water and sediment will then be pumped out of these holding tanks into transport tank trucks for off-site disposal. Before disposal, the water and sediment will be characterized for total petroleum hydrocarbons (TPH), volatile organic compounds (VOCs), Acid/Base/Neutrals (ABNs), RCRA metals, pesticides and herbicides. The sediment and water samples will be taken from the temporary holding tanks.

It is estimated that the total project will take approximately one week to complete.

2. Contamination Characterization

Sediment samples were collected from two of the relief wells in November 1992. The samples were analyzed for fuel identification by the U.S. Army Corps of Engineers, New England Division, Environmental Laboratory, Hubbardston, Massachusetts. That analysis indicated that the sediment samples contained coal oil/tar creosote. The concentration of Polynuclear Aromatic Hydrocarbons (PAHs) in one of the samples was 1,400 ppm; however, based on the relatively low concentrations of naphthalene, the laboratory concluded that the creosote was probably from a coal tar source. Arsenic was also detected at a concentration of 28 parts per billion (ppb) and lead was detected at a concentration of 130 ppb.

3. Hazard/Risk Analysis

The overall hazard to personnel performing the proposed work on the site is low. The overall hazard to off-site personnel is rated as low. This hazard assessment is based primarily on the potential for contact with and inhalation of the identified contaminants during the sediment removal activities. If the activities onsite are controlled to minimize contact, the associated health risks will also be controlled. Other potential hazards to onsite personnel may include physical injury from onsite equipment, the weather related hazard of cold stress, and biological hazards. Each of these hazards is described below.

3.1 Chemical Hazards

The chemical hazards associated with the activities to be performed as part of the project are summarized in the following table:

CHEMICAL HAZARDS	
Activity	Potential Hazards
Water and sediment sampling	Splash Hazard, Contaminant contact, Vapor Inhalation
Pumping out water and sediment from relief wells	Splash hazard, Contaminant contact, Vapor Inhalation

The risks associated with chemicals detected in the sediment samples from the two relief wells are described below:

3.1.1 Coal Tar Pitch Volatiles (Polynuclear Aromatic Hydrocarbons)

The coal tar pitch volatiles detected in the sediment samples include the following:

Naphthalene
2-Methyl naphthalene
Acenaphthylene
Acenaphthene
Fluorene
Phenanthrene
Anthracene
Fluoranthene
Pyrene
Benzo(a)anthracene
Chrysene
Benzo(b)fluoranthene
Benzo(k)fluoranthene
Dibenzo(a,h)anthracene
Benzo(g,h,i)perylene
Indeno(1,2,3-cd)pyrene

Coal tar pitch volatiles can affect the body if they are inhaled or if they come in contact with the eyes or the skin. Repeated exposure to coal tar pitch volatiles has been associated with an increased risk of developing bronchitis and cancer of the lungs, skin, bladder, and kidneys. Pregnant women may be especially susceptible to exposure effects associated with coal tar pitch volatiles. Repeated exposure to these materials may also cause sunlight to have a more severe effect on a person's skin. In addition, this type of exposure may cause an allergic skin rash. The current OSHA standard for coal tar pitch volatiles is 0.2 milligrams of coal tar pitch volatiles per cubic meter of air (mg/m³) averaged over an eight-hour work shift.

3.1.2 Metals

The metals detected in the sediment samples from the site include arsenic and lead. However, the concentrations are low and do not pose a major health concern.

3.1 3 Other Chemicals

In addition to the chemicals detected at the site, a risk is posed by the use of methanol to decontaminate sampling equipment at the site. Methanol is a severe eye hazard and caution should be taken during decontamination of equipment to limit splash.

3.2 Physical Hazards

The physical hazards associated with the scope of work addressed in this SSHP are summarized in the following table:

PHYSICAL HAZARDS	
Activity	Potential Hazards
Mobilization and Demobilization	Personal contact with mechanical equipment, danger to trespassers, muscle strain
Pumping out water and sediment from relief wells	Whipping of hoses

3.3 Weather Hazards

The scope of work will be performed during a season of the year when ambient air temperatures could possibly be cold, but are unlikely to be hot. Thus, weather hazards associated with performing the scope of work consist of cold stress, including frostbite and hypothermia. To avoid cold stress, the guidance provided in Attachment A will be followed.

3.4 Biological Hazards

Biological hazards associated with the site include the potential exposure to disease from insects, such as mosquitoes and ticks, and exposure to poisonous plants. Guidelines for reducing these hazards are provided in Attachment B.

4. Accident Prevention

In addition to the instructions specified elsewhere in this plan, the following steps will be taken regarding the prevention and reporting of accidents:

- Safety meetings will be held by the Site Safety Officer in the morning of the first day of work before work begins and each week on Monday morning for the remainder of the work. Observations of compliance with standard operating procedures and progress in the implementation of the SSHP will be discussed. Additional meetings will be held as needed in response to emergency or near miss occurrences or changes in procedures or site conditions.
- All lost time injuries and property damage accidents (excluding on-the-road vehicle accidents off site) in which property damage exceeds \$2,000 will be reported to the Corps of Engineers within 24 hours of the accident using ENG Form 3394. All accidents must be investigated.
- In the event of an employee being sent to a doctor for treatment, a release will be obtained from the doctor on the date of treatment stating either (1) employee is not fit for duty, (2) employee is fit for light duty, or (3) employee is fit for duty. A copy of this release must accompany accident report.
- A record will be maintained of all first aid administered for any job-related injuries.

5. Staff Safety Organization, Qualifications and Responsibilities

GEI's safety organization on this project will be as follows:

- **Health and Safety Specialist**

Loretta Marino Sanford is the Corporate Health and Safety Officer, responsible for development, implementation and oversight of the Health and Safety Program at GEI. Ms. Sanford has over 12 years experience overseeing the Health and Safety Aspects of hazardous waste operations. She shall be available for emergencies and is responsible for approval of this SSHP as well as any modifications if the plans is found to be inadequate or if conditions change.

- **Site Safety and Health Officer**

James W. Gallagher, Jr. is the Project Manager for the project and will serve as the Site Health and Safety Officer (SSHO). His responsibility will be to ensure compliance with all aspects of the SSHP. Mr. Gallagher has over 19 years of professional experience including 7 years on hazardous waste projects. This includes preparation of records, monitoring, use of personal protection equipment (PPE), decontamination, and site control. On health and safety aspects of the project, he shall report to and be under the direct supervision of the Health and Safety Specialist.

- **Secondary Safety and Health Officer**

When Mr. Gallagher is not on site, Mr. Shyam S. Ranjitkar shall be designated as the Site Safety and Health Officer, and shall assume the responsibilities of the SSHO. Mr. Ranjitkar has 16 years of experience including experience managing well drilling operations.

6. Training

6.1 Initial Training

Prior to the performing onsite activities at the site, all workers who perform activities in areas of the site other than the support zone shall receive forty (40) hours of health and safety training for hazardous waste site operations in accordance with 29 CFR 1910.120(e). In addition, supervisors shall have eight (8) hours of supervisory training. The staff listed in the previous paragraph who will have supervisory responsibilities at the site have completed the necessary training as indicated below.

RECORD OF TRAINING		
Name	Date of 40-Hour Training per 29 CFR 1910.120(e)	Date of Most Recent 8-hr Supervisor Training
Loretta Marino Sanford	October 1987	December 1992
James W. Gallagher, Jr.	September 1987	December 1992
Shyam S. Ranjitkar	January 1992	December 1992

All on-site workers shall attend an initial site orientation meeting which includes training on hazard recognition, response to emergencies, explanation of site activities, location of safety supplies, identification of key safety personnel, and explanation of decontamination procedures.

6.2 Periodic Training

If the duration of the project lasts more than one week, follow-up training shall be provided by the SSHO on site once a week.. This training will address personal protective equipment use and maintenance, physical safety from machinery, protection from chemical hazards, decontamination procedures, protection from cold stress and specific safety requirements for any new field procedures.

6.3 Visitor Training

The SSHO shall be responsible for training site visitors, informing visitors of site hazards, assuring visitors read and sign the SSHP, explaining emergency procedures, and instructing them in the use of personal protective equipment required during the site visit.

6.4 Records

A record of all training sessions, including content, duration, instructors, attendance, and verification "signature page" of all personnel who read the SSHP and attend these sessions will be maintained onsite and retained in the project files in the corporate office of GEI at the remainder of the project.

7. Site Personnel Protection Requirements:

Appropriate personnel protective equipment (PPE) and clothing will be provided to all on-site personnel.

7.1 Protective Equipment Types

The personal protective equipment will be provided for respiratory protection, skin protection, head protection, foot protection, eye protection and hearing protection. This equipment shall meet all the requirements in the OSHA Standards (and any applicable ANSI standard) as follows:

OSHA STANDARDS FOR PERSONAL PROTECTIVE EQUIPMENT	
Types of Protection	Regulation
General	29 CFR Part 1910.132 29 CFR Part 1910.1000 29 CFR Part 1910.1001-45
Eye and face	29 CFR Part 1910.133 (a)
Noise Exposure	29 CFR Part 1910.95
Respiratory	29 CFR Part 1910.134
Head	29 CFR Part 1910.135
Foot	29 CFR Part 1910.136

7.2 Personal Protective Equipment Levels

The PPE levels for this project are described below. Upgrade and downgrade action levels from the specified minimum levels of protection will be established by the GEI Health and Safety Specialist. Any downgrade of PPE will be determined by the GEI Health and Safety Specialist.

7.2.1 Level D

- Work Gloves
- Hard Hats
- Safety Goggles or Safety Glasses
- Steel Shank/Steel Toe Work Boots

7.2.2 Level D Modified

- Chemical resistant Tyvek disposable coveralls
- Latex inner and neoprene chemical resistant outer gloves
- Cold weather liner gloves
- Hard Hats
- Safety Goggles or Safety Glasses
- Steel Shank/Steel Toe Work Boots

7.2.3 Level C

- Full face air purifying respirator with organic vapor cartridge
- Chemical resistant Tyvek disposable coveralls
- Latex inner and neoprene chemical resistant outer gloves
- Cold weather liner gloves
- Hard Hats
- Safety Goggles or Safety Glasses
- Steel Shank/Steel Toe Work Boots

7.3 General Personal Protection Equipment

7.3.1 Safety Goggles. Safety goggles to be used on the site will be constructed of a minimum of 0.60" thick acetate lens (fog free) which is seated to allow flexing, have indirect vents for unobstructed side vision, be of light weight design to fit over prescription glasses and meet ANSI Z87.1-1989 standards.

7.3.2 Foot Wear. Foot wear to be used on site will be steel-toed/steel shank neoprene chemical resistant safety boots with skid resistant soles, and meet ANSI Z41.1-1967 standards.

7.3.3 Hard Hats. Hard hats to be used on the site will be constructed of high density non-conductive polyethylene with adjustable six-point headgear suspension, have a visor and meet ANSI Z89.1-1986 Class A,B,C standards.

7.3.4 Tyvek Coveralls. Tyvek coveralls to be used on the site will be constructed of poly laminated material to repel water and moisture; provide a strong chemical resistant barrier; and have elastic wrists and attached booties for maximum protection.

7.3.5 Neoprene Gloves. Neoprene gloves to be used on site as an outer glove will be constructed of a finish to resist punctures, and have an embossed tread grip on the fingers and palms to prevent slipping.

7.3.6 Latex Disposable Gloves. Latex vinyl disposable gloves to be used on the site will be constructed of powder-free or powdered 0.005" gauge natural latex to allow maximum dexterity and durability. These gloves will be used as a second barrier of chemical protection for the hands and shall be worn under neoprene gloves.

7.3.7 Liner Gloves. Liner gloves to be used on site shall be constructed of snug-fitting insulating material which will allow maximum dexterity while being worn under neoprene gloves.

7.3.8 PVC Rain/Splash Suit. PVC rain/splash suits will be made available onsite in the event of rainy weather or emergency response actions to a hazardous spill/release incident. Rain/splash suits will be constructed of PVC material with welded seams; have an attached hood which can fit over a hard hat; and be of a two-piece design with adjustable elastic suspenders, take-ups at wrists and ankles, and be of a Raglan type to allow room for clothing underneath.

7.3.9 Respirators. Air purifying respirators to be used on the site will be of the full-face type, and constructed of either rubber or silicone. All onsite personnel who require prescription glasses to correct vision shall be provided with respirator eye glass lens kits to be worn while using the respirator. All respiratory protective equipment used on the site will be NIOSH/MSHA approved. All onsite personnel who will be expected to wear a respirator shall first meet the training and medical requirements of 29CFR 1910.134 (OSHA) and ANSI Z88.2.

7.4 Expected Levels of PPE On Site

The expected level of personal protective equipment for each task is listed in the table below. The identified level is the initial level of protection to be used. Upgrade to respiratory protection will be based on action levels designated for the site in this SSHP.

EXPECTED LEVELS OF PPE ONSITE	
Activity	Protective Level
Mobilization and Demobilization	Level D
Pumping water and sediment from relief wells	Level D Modified
Sediment and Ground Water Sampling	Level D Modified

8. Medical Surveillance

All personnel working in all onsite areas other than the support zone during the removal of sediment and ground water with the potential for exposure to contaminants, shall be required to have a medical examination before participation in onsite operations. Medical examinations or portions of the exam must be repeated after an exposure or suspected exposure, and upon the termination of employment. The medical examination will be designed by an occupational physician. The following types of contaminants and physical hazards will be considered:

- Heavy metals including lead and arsenic
- Pulmonary function for respirator use

- Audiogram
- EKG

The written medical opinion of the attending physician shall be made available to the Corps of Engineers, at their request, for any site employee.

9. Exposure Monitoring/Air Sampling Program:

Air monitoring of the active work zones for organic vapors will be performed using a Photoionization Detector (PID) or a Flame Ionization Detector (FID). As indicated in the table below, if PID or FID readings reach 10 ppm, work will be halted until Level C protection is provided. If PID or FID readings reach 50 ppm then work will be halted and the area will be evacuated. The hazard and the level of protection shall then be reevaluated with the assistance and approval of the GEI Health and Safety Specialist and the Project Manager.

REQUIRED MONITORING AND ACTION LEVELS			
Contaminant	Equipment	Action Level*	Actions
Organic Vapors	PID or FID	Greater than 10 ppm	Upgrade PPE to Level C Notify Project Manager
Organic Vapors	PID or FID	Greater than 50 ppm	Evacuate Area

The SSHO will record and log all data as to location, time, type of monitoring equipment, and value of each reading. All readings above the established criteria will be reported immediately to the GEI Project Manager.

10. Cold Stress Monitoring

Cold stress monitoring methods, the measures to be taken to avoid cold stress, and the appropriate emergency response procedures shall be in accordance with the guidelines established in American Conference of Governmental Industrial Hygienists (ACGIH) - Cold Stress Threshold Limit Values 1991-1992. These guidelines are summarized in Attachment A. In accordance with Attachment A, the procedures for cold stress monitoring on the site will be as follows:

- A thermometer accurate to 1 degree fahrenheit shall be assigned at any work place where the environmental temperature is known or expected to be below 60°F.
- Whenever the air temperature at a work place falls to 30°F or below, the dry-bulb temperature and wind speed shall be measured and recorded at least every 4 hours.
- The equivalent chill temperature (ECT) shall be obtained from ACGIH Guidelines in all cases where air movement measurements are required. They shall be recorded with the other data in the site log together with a record of the length of time spent working and resting.

11. Standard Operating Safety Procedures, Engineering Controls and Work Practices.

Site preparation and removal of sediment from the relief wells at Hopkinton Dam will require work in a potentially hazardous environment which presents physical hazards as well as chemical hazards. To reduce the physical hazards, the following standard operating safety procedures will be followed.

11.1 General Safety Rules

- All work shall be planned and supervised to prevent injuries.

- Equipment operators shall be thoroughly trained on the safe operation of their equipment.
- All injuries and accidents shall be reported to the SSHO who will report to the GEI Project Manager. The GEI Project Manager will, in turn, report to the Corps of Engineers.
- Supervisors will ensure that employees observe and obey all safety rules and regulations required for the safe conduct of the work.
- An employee reporting for work who, in the opinion of a supervisor or the SSHO, is unable to perform the assigned duties in a safe and reasonable manner will not be allowed on the job.
- Alcoholic beverages and non-prescribed drugs will not be allowed onsite.
- No employee shall be assigned a task without first having been instructed on the proper methods of carrying out the task.
- There will be no horseplay or practical joking on the site.
- All posted safety signs shall be obeyed.

11.2 Electrical Hazards

- All installations, temporary as well as permanent work, shall comply with National Electrical Code and shall be installed by licensed electricians.
- Portable generators shall be properly grounded to ground rods or water lines.
- All 15- and 20-ampere receptacles or outlets used for single-phase circuits throughout the project will be installed with approved Ground Fault Circuit Interrupters operating on ground fault current of not more than 5 milliamperes.
- Portable electric tools will be grounded with three-wire cords and receptacles.
- Electric cords and extension cords shall be used only in continuous lengths without splice, except molded or vulcanized splices may be used where made by a qualified electrician.
- Patched electric cords are prohibited.
- Lamp bulbs will be guarded.
- By-passing of protective devices will not be tolerated, and switches and boxes shall be closed. No work will be performed on "Hot" lines of any voltage.

11.3 Safe Clearance Procedure

Before repairing, connecting, or adjusting any mechanical, electrical, pressure, or hydraulic systems, inadvertent operation will be prevented by locking of switches, controls, or valves or moving parts. Authorization for interruption of systems will be obtained by advance preparation of approved schedule of work, identification of responsible supervisor of the work, and submission of safe operating procedures. Authorization for safe clearance will be obtained in advance from the supervisor, and no system will be interrupted without approved Safe Clearance Procedure.

11.4 Power Equipment

- All machines will be examined daily for safety appliances and condition, and all defects repaired promptly. Periodic maintenance schedules will be followed as recommended by the manufacturer.
- No cranes will be used. A pump hoist may be used to set pumps and equipment in wells. Rigging, hooks, pendants, and slings will be examined frequently, and defective elements removed from the site. All hooks will have safety latches. Worn cable and old socket fittings will not be allowed.
- Tag lines will be used to control swing of suspended loads where appropriate.
- All machines will be shut down for adjustment or oiling. During repair of all machines, blocks or stops will be set to prevent falling or moving of parts should any hydraulic line or control device fail.
- Workers will climb carefully with handholds and grab irons, not jumping on or off any machine, and, in no case, while the machine is in motion.
- All signals to Operators will be given only by one designated, trained Signaller.
- All truck bodies carrying loose materials will be covered.
- No person will be permitted to ride in any truck body, hoist hook, or bucket.

11.5 Hand and Portable Tools

- All tools shall be in good condition without mushroomed heads and split handles, repaired promptly, or removed from the site. This includes privately owned equipment of the workmen.
- Tools shall not be left overhead to fall. Throwing of tools is prohibited.
- Guards will be installed over all cutting, rotating, or moving machine parts.
- Safety fastening will be secured at pneumatic hose connections.
- Compressed air will not be used for cleaning clothes or blowing out dirt.
- Handles of wrenches and come-alongs will not be extended with lengths of pipe.

11.6 Safety Signs

No smoking, keep out, and hard hat areas will be posted.

11.7 Fire Prevention

- Fire extinguishers (20-pound dry chemical and 5-pound halon) will be provided at the work site.
- Explosives will not be used.
- "NO SMOKING" signs and careful watch on areas containing flammable liquids.
- Gasoline and solvents will be handled only in approved safety cans.

- Engines will be shut off while fueling, with no smoking allowed.
- Oily rags and waste will be kept in covered metal containers. All trash and waste will be disposed of daily.
- Welding gas cylinders will be secured upright, capped when not in actual use, and shielded from direct sunlight. Hoses and gauges will be checked for leaks and kept clear of oil and grease. Flowback and explosion of gases will be prevented by installation of safety check valve on each gas torch. Fire extinguishers will accompany portable welding sets.
- Fire watch will be kept for one hour after all cutting or welding.
- Falling sparks from cutting or welding shall be caught in metal or fiberglass screens.
- Temporary heating units will include only components approved by the Underwriters' Laboratories or approved agency. Operators are to be instructed in the manufacturer's recommendations for safe use maintenance of heaters. An approved fire extinguisher will accompany each heater. No unit will be set closer than 10 feet to wood, fabric, or other flammable material. Natural or fan ventilation will be provided for all enclosures containing gas heaters. No plastic hose will be allowed for gas supply, and tanks will be kept outside enclosures.

11.8 Fall Protection

- Tripping hazards will be eliminated by removal of hose, cables, and ropes from walkways, passageways, access ways, and stairways, by proper storage of materials, and by disposal of waste materials.
- All debris shall be placed daily in containers and emptied frequently.
- Nails shall be removed from lumber or flattened immediately.
- Oil and grout spills will be cleaned up immediately, and slippery, icy surfaces will be cleared and sanded.

11.9 Illumination

The work to be performed as part of this project is anticipated to occur during the daylight hours. However, if illumination is required, all areas accessible to employees shall be adequately lighted to intensities as specified in 1910.120(m) Table H120.1 while any work is in progress.

11.10 Sanitation

- Flammable or hazardous materials will be stored in a secured storage container.
- Drinking water will be carried in plastic-lined containers cleaned and refilled daily from public water supply. Paper cups will be furnished, and a place provided for their disposal.
- Toilets will be available at the project office at the dam.
- A basic first-aid kit will be maintained at the work site.
- A first-aid cabinet will be available at the project office.

- No person will be permitted to operate machinery or work in elevated locations while taking antihistamines or other drugs for minor illness.
- A 1-quart, hand-held eyewash kit will be provided at the work site.

12. Site Control Measures

The site work zone is shown as the shaded area in Fig. 1. Site visitors will be restricted from this area unless they are authorized by the Project Manager to enter the work area. The site work area zones will include exclusion zones, contamination reduction zones, and support zone.

12.1 Exclusion Zone

An exclusion zone will be established along the rock berm in the immediate area around each relief well during the time sediment and water are being pumped from the well. In addition, a second exclusion zone will be established around the temporary holding tanks into which the sediment and water will be pumped. The temporary holding tanks will be placed within the portion of the work zone west of the stilling basin.

12.2 Contamination Reduction Zone

A contamination reduction zone will be established at the perimeter of the exclusion zone established for each well. This zone will serve as the personnel and equipment decontamination area.

12.3 Support Zone

The support zone will be established within the work area, beyond the exclusion zone and contamination reduction zone. The support zone will be used to store clean equipment, take work/rest breaks and serve as an observation location for onsite personnel and visitors who do not meet the 20 CFR 1910.120 training and medical requirements.

13. Personal Decontamination

The following procedure will be followed for personal decontamination:

- At the perimeter of the exclusion zone, rain/splash suits will be damp-wiped or wet sprayed to remove any adhered particulates.
- Respirators, if used, will be removed and prepared for reuse or decontamination.
- Hard hats will be removed and scrubbed with detergent.
- Tyvek suits will be discarded.
- Chemical resistant outer gloves will be rinsed and then removed and, depending on condition, disposed (if damaged or uncleanable).
- Inner gloves will be removed and disposed
- Personnel will wash their hands, neck and face.

Discarded PPE will be collected in a drum and properly disposed of off site. Water used for personal decontamination will be collected and disposed of with the sediment and water from the relief wells.

14. Equipment Decontamination

All sampling equipment will be decontaminated with successive rinses of methanol and then distilled water. All heavy and light equipment which operates in the exclusion zone shall be decontaminated with water or using a steam cleaner. Equipment used in the exclusion zone need not be decontaminated every day if that equipment will remain in the exclusion zone during its use.

The water used for equipment decontamination will be collected and disposed of with the sediment and water pumped from the relief wells.

15. Emergency Equipment

15.1 First Aid Equipment

A basic first-aid kit will be maintained at the work site in the contaminant reduction zone. A first-aid cabinet will be available at the project office.

15.2 Emergency Eye Wash

A 1-quart, hand-held eyewash kit will be provided at the work site in the contaminant reduction zone.

15.3 Fire Extinguishers

A 5-pound halon fire extinguisher will be provided at the work site in the contaminant reduction zone.

16. Emergency Response and Contingency Procedures

16.1 Evacuation

In the event PID or FID readings at the site exceed 50 ppm, the site will be evacuated. All workers will get upwind of the hazard and meet at the site office.

16.2 Accident Procedures

If physical injury or accidental exposure (inhalation, skin contact, or ingestion) occur, the following procedures are to be followed:

- Remove the injured or exposed worker(s) from immediate danger.
- Render first aid as needed. Decontaminate affected personnel.
- Call EMS for transport to hospital. (refer to the emergency numbers listed in the table of **Emergency Information**, below). This procedure is recommended even if there is no apparent serious injury.
- Evacuate other personnel from the immediate affected area to a safe location until the Project Manager and/or the SSHO determines that it is safe for work to resume.
- Develop procedures or modify existing procedures to prevent re-occurrence.

Both the SSHO and the secondary SSHO are trained and qualified to administer first aid/CPR on the job site. In addition, the drilling subcontractor on the project will be required to provide at least one crew person trained and qualified to administer first aid/CPR.

16.3 Emergency Information

The following table of emergency information, including directions to the nearest hospital and a list of emergency services and contacts and their telephone numbers, will be posted conspicuously at the work site, and all site personnel will be made aware of their location.

EMERGENCY INFORMATION		
Important Phone Numbers		Directions to Hospital (See Fig. 2)
Local Police	(603) 746-4141	Hospital address: Concord Hospital Concord, New Hampshire Leave site, take left and continue on Route 127 until Route 127 intersects Route 202-Route 9. Take left at the junction and continue towards East on Route 202-Route 9 for about 11 miles. Concord Hospital is on the left.
Fire Department	(603) 225-3355	
State Police	(603) 271-3636	
Concord Hospital	(603) 225-2711	
Safety Specialist Loretta Sanford	(617) 721-4094	
Project Manager James W. Gallagher	(617) 721-4010	
USACE Contact (Site) David Shepardson	(603) 746-3601	
USACE Contact (NED) Terrance Wong	(617) 647-8177	
Utilities (Mass) ME, NH, VT, & RI	(800) 322-4844 (800) 225-4977	
Nearest Telephone Location: Project Office		

Site Personnel

GEI Consultants, Inc.

Subcontractor/Other

Attachments

- Fig. 1 - Site plan
- Fig. 2 - Route to Hospital
- Attachment A - Cold Stress Guidelines (Appendix A)
- Attachment B - Biological Hazard Guidelines (Appendix B)

Once the site-specific health and safety form has been read, complete this sign-off and return it to Loretta Sanford, GEI Corporate Health and Safety Specialist.

SITE-SPECIFIC SAFETY PLAN SIGN-OFF

All personnel conducting site activities must read the site-specific health and safety plan; be familiar with the requirements of this plan and agree to its implementation.

Site Name: Huplaantar Dam Project No: 93242

I have received and read the plan, been briefed on it, and agree to implement the provision of the plan.

Name: Rodger M. ... Signature: [Signature]

Name: JAMES W. ... Signature: [Signature]

Name: KEVIN ... Signature: [Signature]

Name: Dwight Johnson Signature: [Signature]

Name: Shyam S. Ranjith Signature: [Signature]

Name: _____ Signature: _____

Name: _____ Signature: _____

Name: _____ Signature: _____

Task(s) assigned: _____ Date: _____

Project Manager: _____

Safety Specialist: _____

SITE-SPECIFIC SAFETY PLAN SIGN-OFF

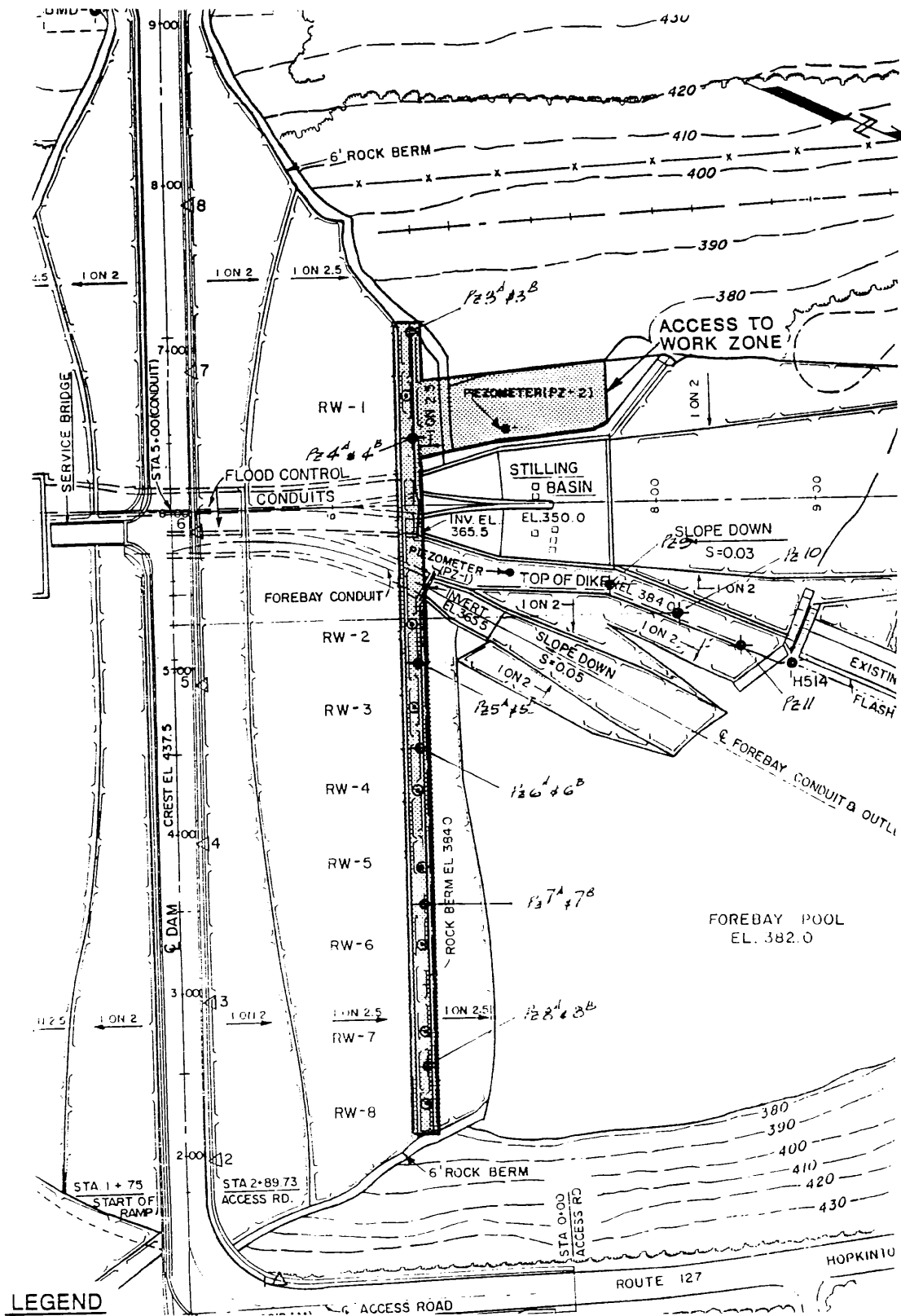
All personnel conducting site activities must read the site-specific health and safety plan; be familiar with the requirements of this plan and agree to its implementation.

Site Name: _____ Project No: _____

Contractors are responsible for the Health and Safety of their personnel. I have read and been briefed on the information contained in the attached health and safety plan.

CONTRACTOR

Name: _____ Signature: _____



U.S. Army Corps of Engineers
New England Division
Waltham, Massachusetts

Cleanout of Relief wells
Hopkinton Lake Dam
Hopkinton, New Hampshire

SITE PLAN



GEI Consultants, Inc.

Project 93262

November 1993

Fig. 1

As a rule, the onset of severe shivering signals danger to personnel. Exposure to cold shall be immediately terminated for any severely shivering worker.

Signs of Hypothermia

1. Severe shivering
2. Abnormal behavior
3. Slowing
4. Stumbling
5. Weakness
6. Repeated falling
7. Inability to walk
8. Collapse
9. Stupor
10. Unconsciousness

EMERGENCY ACTION

1. Remove the victim from the hypothermia/frostbite producing environment.
2. Seek expert medical help immediately.
3. Reduce handling to a minimum. Do not rub or massage the victim.
4. Prevent further body heat loss by covering the victim lightly with blankets. Plastic may be used for further insulation. Do not cover the victim's face.
5. If the victim is still conscious administer hot drinks; encourage activity, such as walking while wrapped in a blanket. Do not administer any form of sedative, tranquilizer or analgesic (pain reliever). These may facilitate further heat loss and convert moderate hypothermia into a severe case.

WORK-PLACE MONITORING

Work-place monitoring is required as follows:

1. A thermometer accurate to 1 degree fahrenheit shall be assigned at any work place where the environmental temperature is known or expected to be below 60°F.
2. Whenever the air temperature at a work place falls to 30°F or below, the dry-bulb temperature and wind speed shall be measured and recorded at least every 4 hours.
3. The equivalent chill temperature (ECT) shall be obtained from ACGIH Guidelines in all cases where air movement measurements are required. They shall be recorded with the other data in the site log together with a record of the length of time spent working and resting.

WORK-WARMING REGIMEN

If work is performed continuously in the cold at an ECT of 20°F or below, heated warming shelters shall be made available for use by employees during warm-up breaks. A work-warming regimen will be established using Table 3 of the ACGIH Guidelines. This table assumes that all workers are properly clothed for periods of work at temperatures below freezing.

When entering the heated shelter the outer layer of clothing shall be removed and the remainder of the clothing loosened to permit sweat evaporation. A change of dry work clothing shall be provided as necessary to prevent workers from returning to their work with wet clothing. Dehydration, or the loss of body fluids, occurs insidiously in the cold environment and may increase the susceptibility of the worker to cold injury due to a significant change in blood flow to the extremities. Warm sweet drinks and soups should be provided at the work site to provide caloric intake and fluid volume. The intake of coffee shall not be permitted because of a diuretic and circulatory effect.

For work practices at or below 10°F ECT the following shall apply:

1. The worker shall be under constant protective observation (buddy system or other direct supervision).
2. The work rate should not be so high as to cause sweating that will result in wet clothing; if heavy work must be done, all rest periods must be taken in heated shelters and the opportunity for changing into dry clothing shall be provided.

3. Provision shall be made to make sure employees shall become accustomed to the required protective clothing as well as to their working environment.
4. The working conditions and weight and bulkiness of clothing shall be included in estimating the required work performance and weights to be lifted by the worker.
5. The work shall be arranged in such a way that sitting still or standing still for long periods is minimized. Unprotected metal chair seats shall not be used. The worker should be protected from drafts to the greatest extent possible.
6. The workers shall be instructed in cold weather procedures. The training program shall include as a minimum instruction in:
 - a. Proper rewarming procedures and appropriate first aid treatment.
 - b. Proper clothing practices.
 - c. Proper eating and drinking habits.
 - d. Recognition of impending frostbite.
 - e. Recognition of signs and symptoms of impending hypothermia or excessive cooling of the body even when shivering does not occur.
 - f. Safe work practices.

SPECIAL MEDICAL CONSIDERATIONS

Employees shall be excluded from work in cold at 30°F or below if they are either suffering from diseases or taking medication which interferes with normal body temperature regulation or reduces tolerance to work in cold environments. The SSHO shall document this for each worker during site training. Workers who are routinely exposed to temperatures below -10°F with wind speeds less than 5 miles per hour, or air temperature below 0°degrees fahrenheit with wind speeds less than 5 miles per hour should be medically certified as suitable for such exposures.

Trauma sustained in freezing or subzero conditions requires special attention because an injured worker is predisposed to secondary cold injury. Special provisions must be made to prevent hypothermia and secondary freezing of damaged tissues in addition to providing for first aid treatment.

For exposed skin, continuous exposure will not be permitted when ECT of -25°F is anticipated.

At air temperatures of 36°F or less, any worker who becomes immersed in water or whose clothing becomes wet will be immediately provided a change of clothing and be treated for hypothermia.

PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

Since prolonged exposure to cold air, or to immersion in cold water, at temperatures well above freezing can lead to dangerous hypothermia, whole body protection must be provided as follows:

- Adequate insulating clothing to maintain core temperatures above 97°F must be provided to workers if work is performed in air temperatures below 40°F. Wind chill or the cooling power of the air is a critical factor. The higher the wind speed and the lower the temperature in the work area, the greater the insulation value of the protective clothing required. An equivalent chill temperature chart relating the actual dry bulb air temperature and the wind velocity is presented in the ACGIH Guidelines. The equivalent chill temperature must be used when estimating the combined cooling effect of wind and low air temperatures on exposed skin or when determining clothing insulation requirements to maintain the deep body core temperature.
- Older workers or workers with circulatory problems require special precautionary protection against cold injury. The use of extra insulating clothing and/or a reduction in the duration of the exposure period are among the special precautions which shall be considered. The precautionary actions to be taken will depend upon the physical condition of the worker and shall be determined, with the advice of a physician who is knowledgeable of cold stress factors, and the medical condition of the worker.
- Special protection of the hands is required to maintain manual dexterity as follows:
 - If fine work is to be performed with bare hands for more than 10-20 minutes in an environment below 60°F, special provisions shall be established for keeping the worker's hands warm. For this purpose, warm air jets, radiant heaters (fuel burner or electric radiator), or contact warm plates may be utilized. Metal handles of tools and control bars shall be covered by thermal insulating material at temperatures below 30°F.

- If the air temperature falls below 60°F for sedentary work, 40°F for light work, or 20°F for moderate work and fine manual dexterity is not required, then gloves shall be used by the workers.
- To prevent contact frostbite, the workers must wear anti-contact gloves and follow the provisions shown below:
 - When cold surfaces below 20°F are within reach, a warning should be given to each worker by his supervisor to prevent inadvertent contact by bare skin.
 - If the air temperature is 0°F or less, the hands should be protected by mittens. Machine controls and tools for use in cold conditions should be designed so that they can be handled without removing the mittens.
- Provisions for additional total body protection is required if work is performed in an environment at or below 40°F. The workers shall wear cold protective clothing appropriate for the level of cold and physical activity:
 - If the air velocity at the job site is increased by wind, draft, or artificial ventilating equipment, the cooling effect of the wind shall be reduced by shielding the work area, or by wearing an easily removable outer windbreak garment.
 - If only light work is involved and if the clothing on the worker may become wet on the job site, the outer layer of the clothing in use shall be of a type impermeable to water. The outer garments must include provisions for easy ventilation in order to prevent wetting of inner layers by sweat. If work is done at normal temperatures or in a hot environment before entering the cold area, the employee shall make sure that his clothing is not wet as a consequence of sweating. If his clothing is wet, the employee shall change into dry clothes before entering the cold area. The workers shall change socks and any removable felt insoles at regular daily intervals or use vapor barrier boots. The optimal frequency of change shall be determined empirically and will vary individually and according to the type of shoe worn as well as how much the individual's feet sweat.
 - If extremities, (ears, toes, and nose), cannot be protected sufficiently to prevent sensation of excessive cold or frostbite by handwear, footwear, and face masks, these protective items shall be supplied in auxiliary heated versions.

- If the air temperature falls below 60°F for sedentary work, 40°F for light work, or 20°F for moderate work and fine manual dexterity is not required, then gloves shall be used by the workers.
- To prevent contact frostbite, the workers must wear anti-contact gloves and follow the provisions shown below:
 - When cold surfaces below 20°F are within reach, a warning should be given to each worker by his supervisor to prevent inadvertent contact by bare skin.
 - If the air temperature is 0°F or less, the hands should be protected by mittens. Machine controls and tools for use in cold conditions should be designed so that they can be handled without removing the mittens.
- Provisions for additional total body protection is required if work is performed in an environment at or below 40°F. The workers shall wear cold protective clothing appropriate for the level of cold and physical activity:
 - If the air velocity at the job site is increased by wind, draft, or artificial ventilating equipment, the cooling effect of the wind shall be reduced by shielding the work area, or be wearing an easily removable outer windbreak garment.
 - If only light work is involved and if the clothing on the worker may become wet on the job site, the outer layer of the clothing in use shall be of a type impermeable to water. The outer garments must include provisions for easy ventilation in order to prevent wetting of inner layers by sweat. If work is done at normal temperatures or in a hot environment before entering the cold area, the employee shall make sure that his clothing is not wet as a consequence of sweating. If his clothing is wet, the employee shall change into dry clothes before entering the cold area. The workers shall change socks and any removable felt insoles at regular daily intervals or use vapor barrier boots. The optimal frequency of change shall be determined empirically and will vary individually and according to the type of shoe worn as well as how much the individual's feet sweat.
 - If extremities, (ears, toes, and nose), cannot be protected sufficiently to prevent sensation of excessive cold or frostbite by handwear, footwear, and face masks, these protective items shall be supplied in auxiliary heated versions.

- If the available clothing does not give adequate protection to prevent hypothermia or frostbite, work shall be modified or suspended until adequate clothing is made available or until weather conditions improve.
- Workers handling evaporative liquid (gasoline, alcohol, or cleaning fluids) at air temperatures below 40°F shall take special precautions to avoid soaking of clothing or gloves because of the added danger of cold injury due to evaporative cooling. Special note should be taken of the particularly acute effects of splashes of "cryogenic fluids" or those liquids with a boiling point just above ambient temperatures.

REFERENCES

ACGIH TLV Booklet, 1991-1992.

Attachment B

Tick-Borne Diseases

Lyme disease is caused by a bacterial parasite called spirochete, and is spread by infected ticks that live in and near wooded areas, tall grass, and brush. Once the tick deposits the spirochete, it must feed on the host blood for 12 to 24 hours before it can transmit the disease. The ticks that cause the disease in the Northeast and Midwest are often no bigger than a poppy seed or a comma in a newsprint. The peak months for human infection are June through October. There are many other tick borne diseases such as Rocky Mountain Spotted Fever which can be carried by a variety of ticks. The prevention and treatment of these diseases are similar to those of Lyme disease.

Prevention

Ticks hang on blades of grass or shrub waiting for a host to come by. When a host brushes against the vegetation, the tick grabs on. They usually first climb onto a persons legs and then crawl up looking for a place to attach. Preventative measures includes wearing light-colored clothing, keeping clothing buttoned, tucking pant legs in socks, and keeping shirt tails tucked in. Periodic checks for ticks should be made during the day, and especially at night. Hair should also be checked by parting it and combing through it to make sure that no ticks have attached to the scalp. Also, check clothing when it is first removed, before ticks have a chance to crawl off.

The most common repellent recommended for ticks is N,N-dimethyl-m-toluamide, or DEET. It is important to follow the manufacturer's instructions found on the container for use with all insecticides especially those containing DEET.

In general, DEET insect repellent should only be applied to clothing, not directly on the skin. Do not apply to sunburns, cuts or abrasions. Use soap and water to remove DEET once indoors.

Removal

The best way to remove a tick is removal by tweezers. If tweezers are not available, cover your fingers (tissue paper) while grasping the tick. It is important to grasp the tick as close as possible to the site of attachment and use a firm steady pull to remove it. When removing the tick, be certain to remove all the mouth parts from your skin so as not to cause irritation or infection. Wash hands immediately after with soap and water, and apply antiseptic to the area where tick was removed.

A new device called the "tick solution" is now available for tick removal. Tick kits, which includes a specially designed tweezers which aids in the proper removal of the tick along with DEET insect repellent, are available through the equipment manger or Corporate Health and Safety specialist.

Testing and Symptoms of Lyme Disease

A variety of tests exist for determining Lyme Disease infection. However, most of these tests are not exact. The first symptoms of Lyme Disease usually appear from two days to a few weeks after a person is bitten by an infected tick. Symptoms usually consist of a ring-like red rash on the skin where the tick attached. The rash is often bull's eye-like with red on the outside and clear in the center. The rash may be warm, itchy, tender, and/or "doughy". Unfortunately, this rash appears in only 60 to 80 percent of infected persons. An infected person also has flu-like symptoms of fever, fatigue, chills, headaches, a stiff neck, and muscle aches and pains (especially knees). Rashes may be found some distance away from original rash. These symptoms often disappear after a few weeks.

Poisonous Plants

Common Poison Ivy (Rhus radicans) grows as a small plant, a vine, and a shrub. Poison Ivy occurs in every state. The leaves always consist of three glossy leaflets. Poison Sumac (Rhus vernix) grows as a woody shrub or small tree 5 to 25 feet tall. It usually contains nine leaves, with eight paired leaves and one on top, and is common in swampy areas. The plants are potent sensitizers and can cause a mild to severe allergic reaction. This reaction is called contact dermatitis.

Dermatitis, in Rhus-sensitive persons, can result from contact with the milky sap found in the roots, stems, leaves, and fruit. The sap may retain its potency for months or years in a dry atmosphere, and can occur during any time of the year. The sap may also be carried by animals, equipment or apparel.

The best form of prevention is to avoid contact. This can occur by wearing long sleeves and gloves if necessary. Disposal clothing, such as tyvek, is recommended in high risk areas to avoid exposure from contaminated apparel. Barrier creams and cleaners are also recommended. Poison oak and ivy cleanser which easily removes the sap and reduces the risk of exposure, is available in the through the equipment manager or Corporate Health and Safety manager.

APPENDIX B

Laboratory Data Report



AQUARIAN ANALYTICAL INC.

Laboratory Services

P.O. Box 186
Canterbury, N.H. 03224
603-783-9097

RECEIVED

MAR 4 1994

03-03-94,15:45

Mr. Ridgley Mauck
GEI Consultants, Inc.
53 Regional Drive
Suffolk Building
Concord, N.H. 03301-8500

Dear Mr. Mauck:

Please find enclosed the reports, and invoice for the samples that were logged in on, 02-23-94.

AAI Sample	Date Sampled	Project Description	Sample Location
12374	02-22-94	93262, HOPKINTON PO # 0025	FRAC. TANK

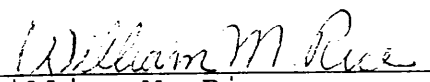
To perform these analyses, the following methods were used:

QTY. EPA Methodologies/Applications

1	VOA + TPH Water	gasoline	Mod. 624
1	Herbicides	EPA-8150	
1	PCB's/Pesticides	EPA-8080	
7	ICP Metals	EPA-6010/200.7	ea.
1	Mercury analysis		
1	EPA-625/8270	PAH only	

Thank you for using Aquarian Analytical Inc. on this project.
If I can be of any further help, please feel free to call.

Sincerely,


William M. Rice
Laboratory Director

doc. L01784



AQUARIAN ANALYTICAL INC.

Laboratory Services

P.O. Box 186
Canterbury, N.H. 03224
603-783-9097

03-03-94,15:45

As part of Aquarian's ongoing quality assurance program, all analyses included the following quality assurance measures.

Samples were received in an acceptable condition.

Samples were prepared and analyzed within the appropriate hold time specified in the method referred to on the analyses sheet.

The instrument that was used for the analyses was calibrated and/or tuned at the required frequency.

A daily calibration check was performed.

A daily blank was run, and contamination was not observed at levels that would affect the analyses.

For all work, internal standards, and surrogates gave appropriate response levels.

Matrix spikes were added where appropriate, and recoveries were within the acceptable range.

Duplicates were run at the frequency specified in the applicable state or federal regulations.

In addition to the above steps, all original-raw data is on file at Aquarian Analytical's offices for inspection when required.

UMR
Certification



AQUARIAN ANALYTICAL INC.

Laboratory Services

P.O. Box 186

Canterbury, N.H. 03224

603-783-9097

Volatile Organic Report

02-28-94, 09:46

Sample 12374

Sample Matrix = Water Project = 93262, HOPKINTON PO # 0025
Date Sampled = 02-22-94, 15:00 Sampler = R. MAUCK
Date Logged In = 02-23-94, 09:02 Location = FRAC. TANK
Date of Analysis = 02-23-94 Town = HOPKINTON

Organic Compound	Result ug/L	Det. Lim. ug/L
Bromodichloromethane	BD	2
Chlorodibromomethane	BD	2
Bromoform	BD	2
Chloroform	BD	2
Carbon Tetrachloride	BD	2
dichloromethane	BD	4
1,1-dichloroethane	BD	2
1,2-dichloroethane	BD	4
1,1,1-trichloroethane	BD	2
1,1,2-trichloroethane	BD	2
1,1-dichloroethylene	BD	2
Trichloroethylene	BD	2
Tetrachloroethylene	BD	2
1,2-Dichloroethylene (c)	BD	2
1,2-Dichloroethylene (t)	BD	2
Chloroethane	BD	2
Vinylchloride	BD	2
Bromomethane	BD	2
Chloromethane	BD	2
Trichlorofluoromethane	BD	4
Benzene	4	2
Toluene	50	2
Ethylbenzene	9	2
m&p-Xylene	20	2
o-Xylene	16	2
Chlorobenzene	BD	2
1,2-dichlorobenzene	BD	2
1,3-dichlorobenzene	BD	2
1,4-dichlorobenzene	BD	2
1,2,4-trichlorobenzene	BD	2
Styrene	BD	2
Acetone	BD	100
Tetrahydrofuran	BD	50
Diethylether	BD	30
Methyl t-butyl ether	5	2
Methyl isobutyl ketone	BD	50
Methyl ethyl ketone	BD	50
Carbon Disulfide	BD	4
1,1,2-trichloro 1,2,2-trifluoroethane	BD	4

Comments:

Method of Analyses = EPA-624

BD = Below Detection Limit, Results are in parts per billion (ppb) unless otherwise noted.



AQUARIAN ANALYTICAL INC.

Laboratory Services

P.O. Box 186
Canterbury, N.H. 03224
603-783-9097

Poly Aromatic Hydrocarbon Report

02-28-94, 09:48

Sample 12374

Date Sampled = 02-22-94, 15:00 Sampler = R. MAUCK
Date Logged In = 02-23-94, 09:02 Location = FRAC. TANK
Extraction Date = 02-24-94 Town = HOPKINTON
Analysis Date = 02-24-94 Matrix = Water

Organic Compound	Result ug/L	Det. Lim. ug/L
Acenaphthene	29	2
Acenaphthylene	BD	2
Anthrecene	3	2
Benzo (a) anthracene	BD	2
Benzo (b) fluoranthene	BD	2
Benzo (k) fluoranthene	BD	2
Benzo (ghi) perylene	BD	2
Benzo (a) pyrene	BD	2
Chrysene	BD	2
Dibenzo (a,h) anthracene	BD	2
Fluoranthene	8	2
Fluorene	15	2
Indeno (1,2,3-cd) pyrene	BD	2
Napthalene	BD	2
Phenanthrene	2	2
Pyrene	5	2
2-Methylnapthalene	BD	2
1-Methylnapthalene	7	2

Comments:

BD = Below Detection Limit

Method of Analyses = EPA-8270

All Results are in parts per billion (ppb), except as noted.



AQUARIAN ANALYTICAL INC.

Laboratory Services

P.O. Box 186
Canterbury, N.H. 03224
603-783-9097

RCRA Metals

02-28-94,09:54

Sample 12374

Sample Matrix = Water Project = 93262, HOPKINTON PO # 0025

Date Sampled = 02-22-94,15:00 Sampler = R. MAUCK
Date Logged In = 02-23-94,09:02 Location = FRAC. TANK
Date Completed = 02-23-94 Town = HOPKINTON

Metal	EPA method	Result (ppm-mg/L)	Det. Lim. (ppm-mg/L)
Arsenic	200.7	BD	0.0500
Barium	200.7	BD	0.0100
Cadmium	200.7	BD	0.0050
Chromium	200.7	BD	0.0100
Lead	200.7	BD	0.0500
Mercury	245.1	BD	0.0002
Selenium	200.7	BD	0.0500
Silver	200.7	BD	0.0100

Comments:

Metals Preparation = EPA-3005

Results expressed in milligrams/liter, (ppm)
doc. metalc



AQUARIAN ANALYTICAL INC.

Laboratory Services

P.O. Box 186
Canterbury, N.H. 03224
603-783-9097

Pesticide - Herbicide Report 03-03-94, 15:40 Sample 12374

Date Sampled = 02-22-94, 15:00 Sampler = R. MAUCK
Date Logged In = 02-23-94, 09:02 Location = FRAC. TANK
Pest. Completion = 03-02-94 Town = HOPKINTON
Herb. Completion = 03-02-94 Matrix = Water

Organic Compound	Result (ppb)	Det. Lim. (ppb)
Chlordane	BD	1.00
Aldrin	BD	0.20
a-BHC (Alpha)	BD	0.20
b-BHC (Beta)	BD	0.20
g-BHC (Lindane, Gamma)	BD	0.20
d-BHC (Delta)	BD	0.20
DDD	BD	0.20
DDE	BD	0.20
DDT	BD	0.20
Dieldrin	BD	0.20
a-Endosulfan	BD	0.20
b-Endosulfan	BD	0.20
Endosulfan Sulfate	BD	0.20
Endrin	BD	0.20
Endrin aldehyde	BD	0.20
Heptachlor	BD	0.20
Heptachlor epoxide	BD	0.20
Methoxychlor	BD	1.00
Toxaphene	BD	1.00
2,4-D	BD	1.00
Silvex	BD	1.00

BD = Below Detection Limit

Methods = Pesticides = EPA-8080, Herbicides = EPA-8150

All of the results on this page were performed by a N.H. certified reference laboratory.



AQUARIAN ANALYTICAL INC.

Laboratory Services

P.O. Box 186
Canterbury, N.H. 03224
603-783-9097

PCB Report
03-03-94,15:41
Sample 12374

Sample Matrix = Water Project = 93262, HOPKINTON PO # 0025
Date Sampled = 02-22-94,15:00 Sampler = R. MAUCK
Login Date = 02-23-94,09:02 Location = FRAC. TANK
Date of Analysis = 03-02-94 Town = HOPKINTON

Organic Compound	Result (ppb)	Det. Lim. (ppb)
PCB 1016	BD	2.50
PCB 1221	BD	2.50
PCB 1232	BD	2.50
PCB 1242	BD	2.50
PCB 1248	BD	2.50
PCB 1254	BD	2.50
PCB 1260	BD	2.50

Comments:

BD = Below Detection Limit
Method of Analyses = EPA-608
The tests on this page were performed by a certified
reference laboratory.

PROJECT NAME AND NUMBER:

Hickman Dam # 93262

SAMPLES!

25113

Rachel Mack

[illegible]

RELINQUISHED BY (SIGNATURE): <i>Paula Manda</i>	DATE/TIME: (hours) 2/23/94 0600	RECEIVED BY (SIGNATURE): <i>Paula Manda</i>
RELINQUISHED BY (SIGNATURE): <i>Paula Manda</i>	DATE/TIME: 2/23/94 0627	RECEIVED BY (SIGNATURE): <i>Paula Manda</i>
RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED FOR LABORATORY BY (SIGNATURE):

[illegible]

RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED BY (SIGNATURE):
RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED BY (SIGNATURE):
DATE/TIME:	REMARKS:	

APPENDIX C

Material Disposal Documentation



Total Waste Management Corp.
142 River Road, Newington, NH 03801
Non-Hazardous Waste Manifest
(Oil / Water)

For TWM Use Only

Please Print or Type:

(Form Designed for use on elite (12 pitch) Typewriter)

Non-Hazardous Waste Manifest		1. Generator's US EPA ID N° N.H.P.0.0.0.0.0.8.1.0.3.0.3.6.6.0		Information must be filled in completely.		
3. Generator's Name and Mailing Address US Army Corp of Engineers Geotech 424 Trapelo Road Waltham, MA 02254		4. Generator's Phone: (617) 647-8177		A. Manifest Document Number 3660		
5. Transporter 1 Company Name Total Waste Management Corp.		6. US EPA ID N° N.H.D.9.8.0.5.2.1.8.4.3		B. Site Address Hopkinton Dam Contoocook, NH		
7. Transporter 2 Company Name Total Waste Management Corp.		8. US EPA ID N° N.H.D.9.8.0.5.2.1.8.4.3		C. State Transporter's ID NHAP2945		
9. 1st Designated Facility Name and Mailing Address Total Waste Management Corp. 142 River Road Newington, NH 03801		10. US EPA ID N° N.H.D.9.8.0.5.2.1.8.4.3		D. Transporter's Phone (603) 431-2420		
				E. State Transporter's ID		
				F. Transporter's Phone (603) 431-2420		
				G. Facility Phone (603) 431-2420		
11. US D.O.T. Description (Including Proper Shipping Name, Hazard Class, and ID Number)		12. Containers N°	Type	Total Quantity	Unit Wt/Vol	State Waste N°
a. Waste Combustible Liquid, n.o.s. Combustible Liquid, NA1993, PGIII			T.T		G	NH01
Non-R.C.R.A. Waste Liquid, None, none, none		001	T.T	0.1200	G	None
J. Additional Descriptions for Materials Listed Above a. Used <u>Oil</u> <i>Residue 3494 TO ECC</i> b. Oily Water						
5. Special Handling Instructions and Additional Information TWM Work Order #: 7576 KS		Actual Wt.IN Actual Wt.OUT Actual Net Wt.		24 Hr. Emergency Contact Phone N° (603) 431-2420		
16. Generator's Certification: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations. or Shipments of used oil, I additionally certify that this material neither contains Polychlorinated Biphenyls (P.C.B.'s) greater than or equal to 2 PPM, nor has been mixed in any way with P.C.B.'s in concentrations greater than or equal to 2 PPM. This oil is destined to be recycled and is subject for regulation by the New Hampshire Department of Environmental Services under Part ENV-WM 807. I certify that the used oil is not a hazardous waste liquid as defined in ENV-WM 807.04 and that I have not mixed this used oil with any other hazardous wastes identified in Chapter ENV-WM 400 or any used oil classified as a hazardous waste liquid under ENV-WM 807.04.						
Generator's Representative Printed / Typed Name FOR U.S. ARMY CORPS OF ENGINEERS JOHN McDOWELL		Generator's Representative Signature <i>John McDowell</i>		Month Day Year 03/07/94		
17. Transporter 1 Acknowledgement of Receipt of Materials Transporter 1 Representative Printed / Typed Name Daniel J DeButti		Transporter 1 Representative Signature <i>D. DeButti</i>		Month Day Year 03/07/94		
18. Transporter 2 Acknowledgement of Receipt of Materials Transporter 2 Representative Printed / Typed Name		Transporter 2 Representative Signature		Month Day Year		
19. Facility Discrepancy Indication Space		HM-181				
20. 1st Facility Owner or Operator: Certification of receipt of Non-Hazardous materials covered by this manifest except as noted in Item 19. Certification of receipt of material on line 11a: 1st Facility Owner Representative Printed / Typed Name DAVID LALIFF						
		1st Facility Owner Representative Signature <i>David Laliff</i>		Month Day Year 03/07/94		
21. 2nd Designated Facility Name and Site Address Environmental Compliance, Inc. 750 East Industrial Park Drive Manchester, NH 03109		US EPA ID N° N.H.D.0.7.2.0.3.8.9.8.7		2nd Facility's Phone (603) 669-7024		
22. 2nd Facility Owner or Operator: Certification of receipt of Non-Hazardous materials covered by this manifest except as noted in Item 19. Certification of receipt of material on line 11b: 2nd Facility Owner Representative Printed / Typed						
		2nd Facility Owner Representative Signature		Month Day Year		

Total Waste Management Corp.

142 River Road, Newington, NH 03801

Non-Hazardous Waste Manifest

(Oil / Water)



(Form Designed for use on file (12 pitch) Typewriter)

Please Print or Type

Information must be filled in completely.

Non-Hazardous Waste Manifest

1. Generator's US EPA ID No.
N. O. N. E.

2. 10.3.6.6.1

3. Generator's Name and Mailing Address
US Army Corps of Engineers Geotech
424 Trapala Road
Waltham, MA 02254A. Manifest Document Number
3661B. Site Address
Hopkinton Dam
Gentee Contoncook, NH

4. Generator's Phone: (617) 647-8177

6. US EPA ID No.

C. State Transporter ID
NH 85218

5. Transporter 1 Company Name

IN-H-D-9-8-0-5-2-1-8-4-31

D. Transporter's Phone (603) 431-2420

7. Transporter 2 Company Name

IN-H-D-9-8-0-5-2-1-8-4-31

E. State Transporter's ID

F. Transporter's Phone (603) 431-2420

9. 1st Designated Facility Name and Mailing Address

10. US EPA ID No.

Total Waste Management Corp.

G. Facility Phone

142 River Road
Newington, NH 03801

IN-H-D-9-8-0-5-2-1-8-4-31

(603) 431-2420

11. US D.O.T. Description (Including Proper Shipping Name, Hazard Class, and ID Number)

12. Containers
No. Type

13. Total Quantity

14. Unit Wt/Vol

15. State Waste No.

a. Waste Combustible Liquid, p.o.s.
Combustible Liquid, NA1993, PG11

No. Type

Total Quantity

Unit Wt/Vol

State Waste No.

b. Non-H.C.R.A. Waste Liquid, None, none, none

No. Type

Total Quantity

Unit Wt/Vol

State Waste No.

12. Additional Descriptions for Materials Listed Above

b) Oily Water

15. Special Handling Instructions and Additional Information

Actual Wt. IN

24 Hr. Emergency Contact Phone No.

Actual Wt. OUT

(603) 431-2420

Actual Net Wt.

16. Generator's Certification: I hereby declare that the contents of this cargo manifest are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

I, the undersigned, certify that this material either contains Polychlorinated Biphenyls (PCB's) greater than or equal to 2 PPM, nor has been mixed in any way with PCB's in concentrations greater than or equal to 2 PPM. This oil is intended to be recycled and is subject to regulation by the New Hampshire Department of Environmental Services under Part I of the RSA 207. I certify that this used oil is not a hazardous waste, but as defined in ENV-WM 407.04 and that I have not mixed this material with any other hazardous wastes identified in Chapter ENV-WM 400 or any used oil classified as a hazardous waste listed under ENV-WM 407.04.

Generator's Representative Printed / Typed Name

Generator's Representative Signature

Month Day Year

17. Transporter 1 Acknowledgement of Receipt of Materials

Transporter 1 Representative Signature

Month Day Year

Transporter 1 Representative Printed / Typed Name

Hal A. Clark

Transporter 2 Representative Signature

Month Day Year

18. Transporter 2 Acknowledgement of Receipt of Materials

Transporter 2 Representative Signature

Month Day Year

Transporter 2 Representative Printed / Typed Name

19. Facility Discrepancy Indication Space

HM-181

1st ACTUAL FACILITY LINE 21

20. 1st Facility Owner or Operator: Certification of receipt of Non-Hazardous materials covered by this manifest except as noted in Item 19.

Certification of receipt of material on line 11a.

1st Facility Owner Representative Printed / Typed Name

1st Facility Owner Representative Signature

Month Day Year

SCOTT CLARK

US EPA ID No.

21. 2nd Designated Facility Name and Site Address

2nd Facility's Phone

Environmental Compliance, Inc.

(603) 669-7024

750 East Industrial Park Drive

IN-H-D-0-7-2-0-3-8-9-8-71

22. 2nd Facility Owner or Operator: Certification of receipt of Non-Hazardous materials covered by this manifest except as noted in Item 19.

Certification of receipt of material on line 11b.

2nd Facility Owner Representative Printed / Typed

2nd Facility Owner Representative Signature

Month Day Year

Scott Clark

Scott Clark

03/07/94



Chemical Waste Management, Inc. BO 8794

WASTE PROFILE

Profile #

CHEMICAL WASTE MANAGEMENT, INC.
26 Liberty Dr., P.O. Box 528
Londonderry, NH 03053

☐ Check here if this is a Recertification

LOCATION OF ORIGINAL

GENERAL INFORMATION

1. GENERATOR NAME: US Army Corp of Engineers Generator USEPA ID: _____
2. Generator Address: Hopkinton Dam Billing Address: ☐ Same CHEMICAL WASTE MANAGEMENT, INC.
26 Liberty Dr., P.O. Box 528
Londonderry, NH 03053
3. Technical Contact/Phone: _____
4. Alternate Contact/Phone: _____ Billing Contact/Phone: _____

PROPERTIES AND COMPOSITION

5. Process Generating Waste: Solids from bottom of monitoring well
6. Waste Name: Solids contaminated with arsenic + lead
- 7A. Is this a USEPA hazardous waste (40 CFR Part 261)? Yes ☒ No ☐
- B. Identify ALL USEPA listed and characteristic waste code numbers (D,F,K,P,U): D004 D008

State Waste Codes: _____

8. Physical State @ 70°F: A. Solid ☒ Liquid ☐ Both ☐ B. Single Layer ☒ Multilayer ☐ C. Free liquid range _____ to _____ %
- 9A. pH: Range 6 to 8 or Not applicable ☐ B. Strong Odor ☐; describe _____
10. Liquid Flash Point: < 73°F ☐ 73-99°F ☐ 100-139°F ☐ 140-199°F ☐ ≥ 200°F ☒ N.A. ☐ Closed Cup ☐ Open Cup ☐

11. CHEMICAL COMPOSITION: List ALL constituents (including halogenated organics) present in any concentration and forward available analysis.

Constituents	Range	Units	Constituents	Range	Units
Dirt	99-100	%			
oil	1	%			
Total Lead	130	ppm			
Total Arsenic	28	ppm			

TOTAL COMPOSITION MUST EQUAL OR EXCEED 100%

12. OTHER: PCBs if yes, concentration _____ ppm, PCBs regulated by 40 CFR 761 ☐ Pyrophoric ☐ Explosive ☐ Radioactive ☐
Benzene if yes, concentration _____ ppm. Shock Sensitive ☐ Oxidizer ☐ Carcinogen ☐ Infectious ☐ Other _____
13. If the waste is subject to the land ban and meets the treatment standards, check here: _____, and supply analytical results where applicable.

SHIPPING INFORMATION

14. PACKAGING: Bulk Solid ☐ Bulk Liquid ☐ Drum ☒ Type/Size: 55 gal Other _____
15. ANTICIPATED ANNUAL VOLUME: 2 Units: drums Shipping Frequency: once

SAMPLING INFORMATION

- 16a. Sample source (drum, lagoon, pond, tank, vat, etc.) _____
- Date Sampled: _____ Sampler's Name/Company: _____
- 16b. Generator's Agent Supervising Sampling: _____ 17. ☐ No sample required (See Instructions.)

GENERATOR'S CERTIFICATION

I hereby certify that all information submitted in this and all attached documents contains true and accurate descriptions of this waste. Any sample submitted is representative as defined in 40 CFR 261 - Appendix I or by using an equivalent method. All relevant information regarding known or suspected hazards in the possession of the generator has been disclosed. I authorize CWM to obtain a sample from any waste shipment for purposes of recertification.

Signature

Printed (or typed) name and title

Date



State of New Jersey
Department of Environmental Protection and Energy
Hazardous Waste Regulation Program
Manifest Section
CN 028, Trenton, NJ 08625-0028

Please type or print in block letters. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039. Expires 9-30-94

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No. NJ 000000001030		Manifest Document No. 00000000		2. Page 1 of 2		Information in the shaded areas is not required by Federal law.					
3. Generator's Name and Mailing Address Army Corp of Engineers 424 Trapelo Rd Waltham MA 02254						A. State Manifest Document Number NJA 1797273							
4. Generator's Phone ()						B. State Generator's ID topkinton Dam							
5. Transporter 1 Company Name Total Waste Management Corp.						C. State Trans. ID NH 03229-9213							
6. US EPA ID Number NJ 000000000000						D. Transporter's Phone (603) 431-2420							
7. Transporter 2 Company Name Chemical Waste Management, Inc.						E. State Trans. ID 00000000							
8. US EPA ID Number NJ 000000000000						F. Transporter's Phone (201) 465-9100							
9. Designated Facility Name and Site Address CHEMICAL WASTE MANAGEMENT OF NEW JERSEY Inc 100 LISTER AVENUE NEWARK NJ 07105-4716						G. State Facility's ID 00000000							
10. US EPA ID Number NJ 000000000000						H. Facility's Phone (201) 465-9100							
11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number) HM a. RC Hazardous waste, solid, a.o.s. 9, RA3077, PG III (D004, D008)						12. Containers No. Type		13. Total Quantity		14. Unit Wt/Vol		15. Waste No.	
						0025		014000					
16. Additional Descriptions for Materials Listed Above ERG4 31 Diox 99-100%, Oil 12, Lead 130ppm, Arsenic 20 ppm						K. Handling Codes for Wastes Listed Above a. S 21							
17. Special Handling Instructions and Additional Information a. TWA W/O 48583 DV; TWA 24 Hour Emergency Contact: (603) 431-2420 b. CWM Profile 480 8794, CWM 24 Hour Emergency Contact: (800) 765-9713 c. Send Certificate of Disposal to Generator and Transporter #1						BTS							
18. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable International and national government regulations. If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.													
Printed/Typed Name Daniel STELLERMAN					Signature Daniel Stellerman					Month Day Year 06 01 94			
17. Transporter 1 Acknowledgement of Receipt of Materials Printed/Typed Name Michael Brancato					Signature Michael Brancato					Month Day Year 06 01 94			
18. Transporter 2 Acknowledgement of Receipt of Materials Printed/Typed Name JAMES C. BOYER					Signature James C Boyer					Month Day Year 06 07 94			
19. Discrepancy Indication Space													
20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19. Printed/Typed Name Philip Mauro					Signature Philip Mauro					Month Day Year 06 05 94			

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)		21. Generator's US EPA ID No. NH P0000081039	Manifest Document No. 179723	22. Page 2 of 2	Information in the shaded areas is not required by Federal law.	
23. Generator's Name US. Army Corp. of Engineers 424 Trapelo Rd. Waltham MA, 02254				L. State Manifest Document Number NJA 179723		
24. Transporter 3 Company Name HORWITH Trucks Inc 1 PA				25. US EPA ID Number 146714878		
25. Transporter Company Name				27. US EPA ID Number		
				N. State Transporter's ID SE110		
				O. Transporter's Phone 215-261-2220		
				P. State Transporter's ID		
				Q. Transporter's Phone		
28. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)				29. Containers	30. Total Quantity	31. Unit Wt/Vol
				No.	Type	R. Waste No.
a.						
b.						
c.						
d.						
e.						
f.						
g.						
h.						
i.						
S. Additional Descriptions for Materials Listed Above				T. Handling Codes for Wastes Listed Above		
32. Special Handling Instructions and Additional Information Item 24 entered for Extra Transporter. Dead 55688						
33. Transporter 3 Acknowledgement of Receipt of Materials				Date		
Printed/Typed Name DAVID A. REHRIG				Signature David A. Rehrig		Month Day Year 06/16/94
34. Transporter Acknowledgement of Receipt of Materials				Date		
Printed/Typed Name				Signature		Month Day Year
35. Discrepancy Indication Space						

